Difficulties Posed by Air District Permitting Practices for Dairy Methane Digesters in San Joaquin and Sacramento Air Districts

Submitted By:

Allen Dusault
Program Director
Sustainable Conservation

July 31, 2009

DOCKET
09-IEP-1G
DATE 7/31/2009
RECD. 8/5/2009

Overview

The San Joaquin Valley Air Pollution Control District ("San Joaquin") and Sacramento Municipal Air Quality Management District ("Sacramento") have jurisdiction over dairies holding approximately three quarters of the state's dairy cows. Thus, the Best Available Control Technology (BACT) determinations by these two districts for dairy methane digesters will likely significantly affect BACT determinations by other air districts in the state for the following reasons:

- San Joaquin and Sacramento are the first air districts in the state to have made BACT determinations for the construction of new dairy methane digesters.
- BACT determinations made by San Joaquin and Sacramento will likely comprise most of the BACT determinations for new dairy methane digesters in the state.
- BACT rules of many other air districts require those districts to establish BACT as the most stringent control technology contained in any district's State Implementation Plan, determined to have been achieved in practice, or determined to be technologically feasible and cost-effective. This requires these districts to consider BACT determinations of other districts in making BACT determinations for their districts.

If the 0.15 g/bhp-hr NOx BACT limit for dairy methane digesters that is currently being used by San Joaquin and Sacramento were to be used by other air districts, dairy methane digester permit applicants in those districts could expect to experience difficulties similar to those being experienced in San Joaquin and Sacramento.

Key aspects of the San Joaquin and Sacramento's air districts' BACT permitting actions for the construction of new dairy methane digesters are discussed below. This discussion underscores why the issue of determining BACT for biogas engines should be included in the Energy Commission's IEPR. This would enable analysis of the important issues regarding determining what is the appropriate BACT for dairy methane digesters and development of solutions to address the significant problems that currently impair the construction and operation of new dairy methane digesters in California.

San Joaquin Air Pollution Control District

During the 2005-2009 time period, San Joaquin first established a NOx BACT emission limit for engines running on dairy digested biogas of 9 ppmv, but more precisely designated as a limit to 0.15 g/bhp-hr.[1] The reasons upon which these NOx emissions limits were based have proved to be unsupportable. Throughout this time, San Joaquin has not updated its BACT Clearinghouse to reflect its BACT determination for engines running on dairy digested biogas.

Gallo Cattle Company ("Gallo")

In November 2005, for the Gallo Dairy, San Joaquin determined that a rich burn engine fueled with dairy digested biogas and using a three-way catalyst would achieve a NOx emission limit of 0.15 g/bhp-hr. This determination was based at least in part on the equipment vendor's claim of expected performance. After Gallo began operations, San Joaquin determined that this emissions limit had been "achieved in practice." This determination meant that all subsequent dairy methane digester applicants would need to meet the 0.15 g/bhp-hr standard, regardless of cost.

Gallo has not been able consistently to maintain emissions below the 0.15 g/bhp-hr NOx emissions limit. Consequently, in 2008 Gallo filed for a variance. In June 2008 the San Joaquin district hearing board granted Gallo's variance based, in part, on finding that Gallo had installed multiple catalysts which each failed, that it was "beyond [Gallo's] reasonable control to know when the catalyst would fail" and under such circumstances, "to require the engines to come into compliance would result in an arbitrary taking of property."

The June 2008 hearing board variance decision required additional engineering studies to be performed "to assess the feasibility of achieving the permitted emissions limit." The board held that the results of these findings "will be used by the District to establish Best Available Control Technology (BACT)" for dairy digester systems. It also held that the "variance shall allow the continued operations of the two subject engines with excess NOx . . . emissions while the system is studied to determine BACT and how to come into compliance and stay in compliance on a continuing basis." Thus, the hearing board effectively held that the district did not have enough information to determine BACT for the Gallo digester system.

Gallo has continued to have trouble in consistently meeting the emissions limit established by San Joaquin. In his April 2009 presentation to the Energy Commission workshop, Mr. Warner, the director of permit services for the district, stated that Gallo's dairy methane digester has achieved a 9 ppmv emission rate "with marginal success." Because Gallo has not had consistent success with regards to NOx emissions, it is currently in the process of applying to the hearing board for a second variance.

Fiscalini Farms & Fiscalini Dairy ("Fiscalini")

In September 2007, after Gallo began operations and San Joaquin had determined that 9 ppmv had been "achieved in practice," Fiscalini received a permit for construction of a dairy methane

[1] Depending on the combustion characteristics, the output-based emission rate 0.15 g/bhp-hr NOx can correspond to volumetric emission rate ranging between 9 and 11 ppmv NOx (at 15% O_2).

digester system with an emissions limit of 9 ppmv. Fiscalini did not believe they could meet that limit, and applied to amend its permit to allow flexibility in the limit for NOx emissions. San Joaquin granted a variable permit in December 2008 that permitted the dairy to emit above 0.15 g/bhp-hr NOx if it used Select Catalytic Reduction (SCR) as a control mechanism, made all reasonable efforts to reduce NOx emissions, and at no time emitted above 0.60 g/bhp-hr NOx.

Fiscalini's amended permit provides that the final BACT level for NOx has not yet been determined for this dairy's source. The permit states that "[c]atalytic controls have not yet been successfully demonstrated on an engine fueled solely by biogas. Therefore, if the catalytic control technology does not perform satisfactorily during the initial trial period or experiences repeated failures that are not the result of improper operation, this technology will not be deemed BACT for this particular installation." As of June 2009, Fiscalini's biogas became operational. Until the two year trial period is completed, it will not be known if engine performs satisfactorily and is able consistently to meet the NOx emissions limit.

Moonlight Dairy

In March 2008, Moonlight Dairy applied to construct a lean burn engine running on dairy digested biogas, and proposed a NOx emission limit of 0.5 g/bhp-hr. In May 2009 San Joaquin first informed Moonlight that its application was incomplete because 0.15g/bhp-hr NOx had been "achieved in practice" and therefore established as BACT. The District further informed Moonlight that it could likely meet the emissions limit by using Select Catalytic Reduction (SCR) with its lean-burn engine, or using microturbines or fuel cells in place of the engine.

After the issuance of the Gallo variance, San Joaquin informed Moonlight that 0.15 g/bhp-hr NOx had not been "achieved in practice" but was nonetheless "technologically feasible."[2] As a result, Moonlight would need to meet the 0.15 g/bhp-hr BACT limit so long as it was determined to be "cost effective." San Joaquin further supported its "technologically feasible" determination by stating that wastewater treatment plants in the South Coast Air Quality Management District were operating under such a limit. Investigations by consultants on behalf of Moonlight determined that these wastewater treatment plants were not consistently achieving the 0.15 g/bhp-hr NOx emissions limit.

In February 2009, San Joaquin issued a determination to Moonlight Dairy denying its dairy methane digester permit application, partly because it has proposed a NOx emissions limit of 0.5 g/bhp-hr. In the denial, San Joaquin stated that "BACT for NOx emissions from the proposed engines is NOx emissions not exceeding 0.15 g/bhp-hr (9-11 ppmv @ 15% O_2), which can be achieved with the use of SCR, or the substitution of microturbines for the proposed engines." San Joaquin determined "the project was not approvable since the applicant has chosen not to propose the BACT requirement for NOx." San Joaquin additionally provided a calculation from which it concluded that use of SCR on the lean burn engine would be cost effective.

In making the cost effectiveness determination for the use of SCR, San Joaquin excluded costs that the applicants considered necessary for operation of the dairy methane digester system.

---

[2] This determination is reflected in San Joaquin's May 28, 2008 letter to AgPower Partners regarding the application to construct a methane digester system at Moonlight Dairy. The letter is appended.

These costs include the installation costs of H_2S scrubbers which are required for proper functionality of the SCR and costs for the maintenance personnel and technicians needed to maintain and repair equipment to ensure that it operates continuously. In addition, in support of its cost effectiveness determination, the district classified dairy methane digester engines as "engine[s] used exclusively in agricultural operations." This resulted in artificially high annual emissions reductions and unrealistic cost-effectiveness calculations.[3] This classification seems inconsistent with the definition of agricultural operations in San Joaquin district's Rule 4550 – and ignored a legal change in status for the engines which allowed sale into the electric grid.

Sacramento Municipal Air Quality Management District

Based on the San Joaquin BACT determinations, Sacramento decided that it would adopt as BACT for dairy methane digesters the NOx emission limit of 9 ppmv.

Tollenaar Holsteins

In April 2008, Tollenaar Holsteins Dairy ("Tollenaar") applied to install a lean-burn engine running on digested diary biogas. In May 2008 and again in June 2008, Sacramento found the application incomplete for failure to select as BACT a control technology with an emissions limit of 9 ppmv NOx, which was determined to be "at least technologically feasible."

Ultimately, Tollenaar decided to construct two small separate engine systems, instead of one larger engine, so that it would not have to comply with BACT requirements for NOx. Sacramento agreed to treat each engine as a separate source for emissions purposes because electricity generated by one engine would be exclusively used to meet on-site load and electricity generated by the other would be sold into the grid. Neither engine individually emitted enough NOx each day to trigger Sacramento's relatively high threshold value of 10 lbs/day, above which BACT requirements must be met.[4] Sacramento agreed to treat the two engines as separate sources for emissions As a result, neither engine is required to meet the Sacramento NOx BACT emission limit.

Results of the Permitting Difficulties in San Joaquin and Sacramento

Several dairies have either not been able to meet on a consistent basis the dairy methane digester BACT NOx emission limit of 0.15 g/bhp-hr established by San Joaquin and Sacramento or have decided not to install digesters because the BACT limit would likely be too costly and/or difficult to meet. Additionally, due largely to the permitting delays related to San Joaquin's BACT determinations for engines running on digested biogas, some facility applicants did not

[3] San Joaquin calculates cost-effectiveness by dividing the facility's total annual cost by the annual emissions reduction (the difference between a district baseline emissions amount and the facility's anticipated emissions). San Joaquin has assigned a much higher emissions baseline for engines used in agricultural operations than for other internal combustion engines, resulting in a much greater value for the annual emissions reduction. When the applicant's total cost is divided by this larger emissions reduction, the result shows a comparatively low cost per ton of pollutant reduced. This results in the situation that a methane digester system may cost up to three times as much as a comparable wastewater treatment plant or a sanitary landfill and still be deemed cost-effective whereas the treatment plant is not.

[4] By comparison, BACT is triggered in San Joaquin for NOx emissions exceeding 2 pounds per day.

meet the deadline requirements for reimbursement under the matching grants provided by the Energy Commission.

Conclusion

The outcomes of dairies wishing to install methane digesters in the San Joaquin and Sacramento districts underscore that the regulatory problems for permitting methane digesters are serious and warrant careful evaluation to determine what solutions can be developed to realize dairy digester benefits. While this memorandum highlights some of the more important regulatory issues, documentation can be provided to illustrate additional legal, regulatory and procedural barriers to permitting dairy methane digesters, many of which have significant implications for the construction of new biomass facilities in California.

Difficulties Posed by Air District Permitting Practices for Dairy Methane Digesters in San Joaquin and Sacramento Air Districts

Submitted By:

Allen Dusault
Program Director
Sustainable Conservation

July 31, 2009

APPENDIX

BEFORE THE HEARING BOARD
OF THE
SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT
NORTHERN REGION
STATE OF CALIFORNIA

In the matter of: Gallo Cattle Company 10561 West Highway 140 Atwater, CA 95301	)	**DOCKET NO. N-08-03R** **ORDER GRANTING A REGULAR VARIANCE**
For a variance from: 2070.7.0 – *Operation According to the Permit to Operate Conditions* 2201 – *New and Modified Stationary Source Review Rule* 4701 – *Internal Combustion Engines* 4702 – *Internal Combustion Engines*	)	
District Permit Numbers: N-1660-7-1 and -9-0	)	**Granted on:** June 4, 2008
EPA Airs Number: N/A	)	**Effective from:** June 4, 2008 **Effective to:** June 4, 2009

On April 24, 2008, Gallo Cattle Company (Gallo) filed with the Northern Region Hearing Board a petition for an interim and regular variance. An interim variance was granted on May 7, 2008. All parties of concern were given reasonable notice of the regular variance petition and hearing. Gallo requested that the Hearing Board grant a regular variance from San Joaquin Valley Air Pollution Control District (District) Rules 2070.7.0, 2201, 4701, and 4702.

On June 4, 2008, a hearing on the petition for a regular variance was held. Mr. Carl Morris and Mr. Ben Ewell represented the petitioner, while Mr. Patrick Houlihan, Senior Air Quality Inspector, represented the District. All persons, including the public, were given the opportunity to give testimony or make comment.

The Hearing Board declared the hearing closed after receiving testimony and took the matter under submission for the decision. The Hearing Board made the following findings of fact.

LOCATION AND EQUIPMENT

1. Gallo operates a cheese processing facility located at 10561 West Highway 140 in Atwater, CA.

2. The subject equipment includes two internal combustion engines fired off digester biogas.

3. The operation of the subject equipment is authorized by duly issued District Permits to Operate (PTO).

BACKGROUND

Gallo Cattle Company (Gallo) operates a cheese processing facility adjacent to a dairy. The dairy lagoon is covered and the methane gas is captured to be used as digester biogas. The biogas is scrubbed to remove moisture and H_2S, and then is piped to a series of engines that burn the gas. Two engines are connected to generators that produce electricity and steam for the cheese plant. Each engine has a catalyst in the exhaust stream to reduce air contaminants. The catalysts have become "poisoned" and non-functioning several times in the past few years which have lead to emission violations. This time Gallo has petitioned for a regular variance to study the whole system to determine if the biogas is being scrubbed adequately, to determine if the biogas pressure is being regulated properly, and to determine if the correct size of catalyst has been being installed. Results of findings during this variance will be used by the District to establish Best Available Control Technology (BACT) for dairy and confined animal facilities covered lagoons and digester gas control and destruction equipment.

RULE REQUIREMENTS AND VIOLATIONS

1. The equipment subject to this variance is regulated by the following District Rules:

   2070.7.0 – *Operation According to the Permit to Operate Conditions*
   2201 – *New and Modified Stationary Source Review Rule*
   4701 – *Internal Combustion Engines*
   4702 – *Internal Combustion Engines*

2. District Rule 2070.7.0 requires that the subject equipment not be operated contrary to the conditions of the applicable ATC's or PTO's. Rule 2201, 4701, and 4702 places emission limits on the equipment.

3. The subject equipment will be in violation of the applicable rules and permit conditions by operating with excessive emissions of NO_X and CO.

FINDINGS OF FACT

1. ***That the petitioner for a variance is, or will be, in violation of Section 41701 or of any rule, regulation, or order of the District.***

   The Hearing Board finds that Gallo is currently in violation of District Rules in addition to the conditions on the PTOs. The two subject engines are operating with excess NO_X and CO.

2. ***That, due to conditions beyond the reasonable control of the petitioner requiring compliance would result in either (1) an arbitrary or unreasonable taking of property, or (2) the practical closing and elimination of a lawful business.***

   The Hearing Board finds that to require compliance would mean that Gallo would have to install a catalyst that does not fail. Gallo has installed multiple catalysts in the last year and each one has failed. The catalyst that was installed under the recent emergency variance has already failed. Gallo has not been able to determine the cause of the failures and it is beyond their reasonable control to know when the catalyst

is about to fail. Without a constant working catalyst, Gallo violates District Rules and their PTO conditions, to require the engines to come into compliance would result in them being shut down, this would result in an arbitrary taking of property.

3. ***That the closing or taking would be without a corresponding benefit in reducing air contaminants.***

The Hearing Board finds that the closing or taking would be without a corresponding benefit in reducing air contaminants because to do so would require the use of additional propane heaters to supply steam. These propane heaters would emit contaminants at about the same concentration as the engines. Also, VOCs and H_2S from the lagoon would be vented out to the atmosphere in the absence of the engines operating. The closing or taking would also cause Gallo to incur daily expenses of $2,800.00 each day in fuel cost for the propane heaters and procuring power from the utility company.

4. ***That the applicant for the variance has given consideration to curtailing operations of the source in lieu of obtaining a variance.***

The Hearing Board finds that Gallo will not be able to curtail operations as the study seeks to get results from normal operating conditions. In order to make a BACT determination, the engines must be under normal operating conditions.

5. ***During the period the variance is in effect, that the applicant will reduce excess emissions to the maximum extent feasible.***

The Hearing Board finds that Gallo will attempt to operate the subject engines under normal operations, which should prevent excess emissions. In addition, when the engines are in operation, emissions from the lagoon are reduced, and the propane water heaters are not fired-up. Gallo also has the use of a flare that can reduce lagoon emissions when the subject engines cannot utilize all the gas.

6. ***During the period the variance is in effect, that the applicant will monitor or otherwise quantify emission levels from the source, if requested to do so by the District, and report these emissions levels to the District pursuant to a schedule established by the District.***

The Hearing Board finds that Gallo will perform many samplings and measurements of the lagoon gas and engine emissions and will supply the results to the District as required. In addition, the District will perform some of the same, and record those results.

GENERAL COMMENTS

A nuisance as defined in District Rule 4102 is not expected to occur as a result of this variance. Nor would continued operations likely create an immediate threat or hazard to public health or safety.

It should be noted that the US Environmental Protection Agency (EPA), might not recognize this variance, should it be granted. Gallo should be aware that the EPA could take enforcement action on this matter if it deems such action is appropriate.

CONCLUSIONS AND ORDER

NOW, THEREFORE, the NORTHERN REGION HEARING BOARD ORDERS that a regular variance be granted to Gallo Cattle Company, subject to the following conditions:

1. The variance shall be effective from June 4, 2008 to June 4, 2009, or until the engineering studies are complete and a BACT determination is made, and Gallo begins continual, in-compliance use of the two subject engines according to that BACT determination, whichever occurs first.

2. Variance relief shall be granted from the applicable requirements of District Rules 2070.7.0, 2201, 4701, and 4702, in addition to the following:

   A. Conditions 8 and 10 of PTO # N-1660-7-1 and;
   B. Conditions 10 and 24 of PTO # N-1660-9-0.

3. The variance shall allow the continued operation of the two subject engines with excess NO_X and CO emissions while the system is studied to determine BACT and how to come into compliance and stay in compliance on a continuing basis.

4. By November 4, 2008 Gallo shall perform the necessary engineering studies to assess the feasibility of achieving the permitted emissions limits. Prepare and submit a detailed report to the District evaluating the digester system from the point that gas is collected from the digester through the point that exhaust gas is treated by the catalyst system, and identifying areas that are potential sources of the problems encountered. In particular, if found infeasible to achieve the permitted emission limits, a detailed analysis on each of the main components of the system (including, but not limited to, the gas scrubber, dryer, air/fuel controller, catalyst system) must be included. The report shall list possible actions that may correct the problems encountered and give detailed reasons why any such actions are considered infeasible for the operation. Additionally, the report shall include estimates of initial capital costs and ongoing operational and maintenance costs for each corrective action considered including, but not limited to:
   a. Increasing the size of the iron sponge H_2S scrubber;
   b. Replacing the existing iron sponge scrubber with a different type of H_2S scrubber (biological scrubber, caustic scrubber, etc), perhaps followed by an iron sponge to achieve necessary H_2S control;
   c. Increasing the size of the catalyst or installing an additional catalyst;
   d. Adding or improving the air to fuel controller for the exhaust catalyst system;
   e. Replacing the engine with a newer model.

A) By June 30, 2008 Gallo shall contract for the services of a catalyst specialist who deals with advanced emission controls for IC engines.

B) Maintain detailed records of system costs including:

a. Replacement cost for scrubbing media;
b. Costs for replacement, repair, and cleaning of catalysts;
c. Other cost necessary to maintain engine operation and compliance with emission limits.

C) Maintain detailed records the total hours of operation, maintenance or modifications performed, operational problems encountered, and any corrective actions taken to restore the system to normal operating conditions. Such records shall include the following:
   a. Tuning procedures performed to bring engines into compliance with emission limits;
   b. Records of the dates of catalyst replacement, repair, and/or cleaning;
   c. Operational status of dryer and H_2S scrubber;
   d. Date of media replacement for the H_2S scrubber.

D) Notify the District Compliance Division at least one week prior to any planned maintenance on or improvements to the emission control systems for the engines.

E) Notify the District Compliance Division immediately (within one hour) of operational problems discovered that require unplanned corrective actions to restore the system to normal operating conditions.

F) Monitor and record Biogas heating value on a weekly basis (using ASTM D 1945 and ASTM D 3588 or another alternative method approved by the District) and monitor and record the following parameters on a daily basis:
   a. H_2S content prior to the scrubber and after the scrubber on a daily basis (using a Testo 350 XL portable analyzer, EPA Method 11, ASTM Method D1072, D3246, or other an alternative method approved by the District).
   b. Moisture content of biogas after the dryer;
   c. Stack concentration of NO_X, CO, and O_2 from the engines using a portable emission monitor that meets District specifications

G) By July 25, 2008 Gallo shall perform a source test on the pre-combustion biogas to determine the VOC content of the biogas in accordance with South Coast AQMD Method 25.3.

5. Should the District receive complaints or if the facility experiences operational conditions likely to cause a public nuisance, Gallo shall cease the operations causing the complaints or problems and take all necessary actions to abate the problem immediately.

6. By June 19, 2009, or 15 days after achieving compliance, whichever occurs first, Gallo shall submit a written report to the District. The summary report shall include:

   A. The dates and times the subject engines operated with excess emissions;
   B. A summary of all excess emissions data collected and recorded; and
   C. The total amount of actual and excess CO and NO_X emissions occurring during the period; and

D. The records and studies required in condition #4 of this variance.

7. All reports and notifications shall be submitted to the attention of:

Mr. Ronald G. Giannone, Supervising AQI
SJVAPCD, Compliance Division
4800 Enterprise Way
Modesto, CA 95356-8718
Telephone: (209) 557-6400
E-mail: ronald.giannone@valleyair.org

8. Failure to comply with any condition of this variance may render it null and void.

MOTION: Schneider **SECOND:** Benak

Ayes: Gohring, Kanai, Benak, Schneider,
Noes: None
Abstained: None
Excused: None
Recused: None
Absent: Scheflo

THE FOREGOING DECISION IS APPROVED:

Mark A. Kanai — JUN 13 2008

Mr. Mark A. Kanai, Chairman
Hearing Board – Northern Region
San Joaquin Valley Unified APCD

Date

ATTEST:

Vicki Christie, Sr. Office asst. — 6/11/08

Vicki Christie, Senior Office Assistant

Date

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

RECEIVED
JUN 17 2008
Ans'd.....

PROOF OF SERVICE

I, Patrick Houlihan, declare:

I am a resident of the State of California and over the age of 18 years, and not a party to the within action; my business address is San Joaquin Valley Unified Air Pollution Control District, 1990 E. Gettysburg, Fresno, California 93726.

On June 16, 2008, I served the within documents:

ORDER GRANTING A REGULAR VARIANCE – **DOCKET #N-08-03R**

XX by placing the document(s) listed above in a sealed envelope, and placing the same for mailing in the United States mail at Fresno, California, in accordance with the company's ordinary practices, and addressed as set forth below.

_____ by transmitting via facsimile the above listed document(s) to the fax number(s) set forth below on this date before 5 p.m.

_____ by personally delivering the document(s) listed above to the person(s) at the Address(es) set forth below:

Mr. Carl Morris
Gallo Cattle Company
10561 West Highway 140
Atwater, CA 95301

Mr. Doug McDaniel
USEPA Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Mr. Ben Ewell
466 West Fallbrook Suite 101
Fresno, CA 93711

Mr. Ed Virgin
CARB – Compliance Division
PO Box 2815
Sacramento, CA 95814

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on June 16, 2008, at Fresno, California.

Patrick Houlihan
Senior Air Quality Inspector

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

COPY

DEC 18 2008

John Fiscalini
Fiscalini Farms & Fiscalini Dairy
7231 Covert Rd
Modesto, CA 95358-9741

Re: Notice of Issuance of Authority to Construct
Project Number: N-1083706

Dear Mr. Fiscalini:

The Air Pollution Control Officer has issued the Authority to Construct to Fiscalini Farms & Fiscalini Dairy to modify the permit for the 1,057 bhp Guascor dairy digester gas-fired engine (N-6311-9) to incorporate flexible provisions for the BACT NO_X limit, which will allow the NO_X limit in the permit of 0.15 g/bhp-hr to be increased if all practical steps are taken to reduce NO_X emissions and it is determined that the engine cannot meet this limit, and to install an SCR system provided by a different supplier.

Enclosed are the Authority to Construct and invoice for the engineering evaluation fees pursuant to District Rule 3010. Please remit the amount owed, along with a copy of the attached invoice, before the due date.

Thank you for your cooperation in this matter. If you have any questions, please contact Mr. Ramon Norman at (559) 230-5909.

Sincerely,

David Warner
Director of Permit Services

Jim Swaney, P.E.
Permit Services Manager

DW: rn

cc: Nettie R. Drake, B & N Enterprises, 29415 Ruth Hill Rd., Squaw Valley, CA 93675

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061
www.valleyair.org

Southern Region
2700 M Street, Suite 275
Bakersfield, CA 93301-2373
Tel: (661) 326-6900 FAX: (661) 326-6985

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

PERMIT NO: N-6311-9-1 **ISSUANCE DATE:** 12/17/20(

LEGAL OWNER OR OPERATOR: FISCALINI FARMS & FISCALINI DAIRY
MAILING ADDRESS: 7231 COVERT RD
MODESTO, CA 95358

LOCATION: 4848 JACKSON RD
MODESTO, CA 95358

EQUIPMENT DESCRIPTION:
MODIFICATION OF 1,057 BHP GUASCOR MODEL SFGLD-560 BIOGAS-FIRED LEAN-BURN IC ENGINE WITH A MIRATECH OXIDATION CATALYST (OR DISTRICT APPROVED EQUIVALENT) AND A MIRATECH SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM CATALYST (OR DISTRICT APPROVED EQUIVALENT) DRIVING A 750 KW ELECTRICAL GENERATOR: INCORPORATE CONDITIONS ALLOWING BACT FOR NOX TO BE DETERMINED AT HIGHER LEVEL IF 0.15 G/BHP-HR IS NOT ACHIEVABLE FOR THE OPERATION AND INSTALL A EF&EE SCR SYSTEM WITH AN INTEGRAL OXIDATION CATALYST INSTEAD OF A MIRATECH SCR SYSTEM AND OXIDATION CATALYST

CONDITIONS

1. All equipment shall be maintained in good operating condition and shall be operated per the manufacturer's specifications to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]
2. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
3. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]
4. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]
5. The engine shall be fired solely on dairy digester gas. [District Rules 2201 and 4801]
6. This engine shall be equipped with an operational non-resettable elapsed time meter. [District Rules 2201 and 4702]
7. The H2S content of the digester gas used as a fuel in the engine shall not exceed 50 ppmv. [District Rules 2201 and 4801]

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (209) 557-6400 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERAT Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with t approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, tl Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying w all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
N-6311-9-1 : Dec 17 2008 9:03AM – NORMANR : Joint Inspection NOT Required

8. Emissions from this IC engine shall not exceed any of the following limits: 0.15 g-NOx/bhp-hr (= 11.0 ppmvd NOx @ 15% O2; NOx referenced as NO2), 1.75 g-CO/bhp-hr (= 210 ppmvd CO @ 15% O2), 0.13 g-VOC/bhp-hr (= 28 ppmvd VOC @ 15% O2), 0.036 g-PM10/bhp-hr. Compliance with the NOx, CO, and VOC limits in this condition shall be based on the arithmetic average of three (3) 30-consecutive-minute test runs. [District Rules 2201 and 4702]

9. Note on NOx BACT Limit: The applicant proposed to meet a NOx emission limit of 0.6 g/bhp-hr as this is a vendo guaranteed emission rate. The applicant has also agreed to the trial installation of catalytic controls on the engine (i necessary) to reduce NOx emissions to a target level of 0.15 g/bhp-hr. Catalytic controls have not yet been successfully demonstrated on an engine fueled solely on dairy biogas. Therefore, if the catalytic control technology does not perform satisfactorily during the initial trial period or experiences repeated failures that are not the result o improper operation, this technology will not be deemed BACT for this particular installation. [District Rule 2201]

10. NOx emissions (as NO2) from the engine in excess of 0.15 g/bhp-hr shall not constitute a violation of this permit provided that NOx emissions are limited to the lowest achievable emission rate to satisfy BACT. BACT for NOx f this engine shall consist of all other emission limitations and operational and design conditions contained in this permit. The final BACT level for NOx shall be determined to the satisfaction of the Air Pollution Control Officer i accordance with District Rule 2201 and the District's BACT policy, after 24 months of operating history. [District F 2201]

11. If NOx emissions from the engine continue to exceed 0.15 g/bhp-hr 24 months after the initial source test, the permittee shall have 90 days to submit a report containing all monitoring and source test information to the District. The report shall also include an explanation of the steps taken to operate and maintain the engine in such a manner t to minimize NOx emissions. In the report, the permittee may also propose a final BACT emission limit for NOx fc inclusion in this permit. The monitoring data and source test information gathered in accordance with this permit n be shared other technical experts so their input can be considered when determining the final BACT limit for NOx t can be consistently achieved. [District Rule 2201]

12. The District shall establish the final BACT limit for NOx, including any applicable averaging periods, and revise th applicable limit contained in the permit within 90 days of receipt of the report from the permittee. In no case shall t final BACT NOx emission limitation be higher than 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2). [District R 2201]

13. The addition of the external emission control technology will be designed or reviewed and signed by a California Licensed Professional Engineer with experience in the design and/or installation of catalytic controls on IC engines and reviewed and approved by District staff. The approved configuration shall remain substantially the same for th first two years of operation with minor adjustments, if required, to the configuration. [District Rule 2201]

14. The temperature of the SCR catalyst shall be maintained within the range for the highest efficiency for NOx reducti as specified by the catalyst manufacturer or emission control supplier. [District Rule 2201 and 4702]

15. The inlet and outlet temperature of the SCR catalyst and the reagent injection rate shall be monitored and recorded during times in which NOx emissions are being source tested or monitored with a portable analyzer. [District Rule 2201 and 4702]

16. The SCR catalyst shall be maintained and replaced in accordance with the recommendations of the catalyst manufacturer or emission control supplier. Records of catalyst maintenance and replacement shall be maintained. [District Rule 2201 and 4702]

17. The ammonia (NH3) emissions shall not exceed 10 ppmvd @ 15% O2. Compliance with the NH3 limit shall be bas on the arithmetic average of three (3) 30-consecutive-minute test runs. [District Rule 2201]

18. Source testing to measure NOx, CO, VOC, and NH3 emissions from this unit shall be conducted initially within 90 days of startup and not less than once every 12 months thereafter. [District Rule 1081, 2201, and 4702]

19. Emissions source testing shall be conducted with the engine operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. [District Rule 4702]

20. For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two of three runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC emissions shall be reported as methane. VOC, NOx, and CO concentrations shall be reported in ppmv, correc to 15% oxygen. [District Rules 2201 and 4702]

CONDITIONS CONTINUE ON NEXT PAGE

21. The following methods shall be used for testing: NOx (ppmv) - EPA Method 7E or ARB Method 100, CO (ppmv) - EPA Method 10 or ARB Method 100, VOC (ppmv) - EPA Method 25A or 25B, or ARB Method 100, stack gas oxygen - EPA Method 3 or 3A or ARB Method 100, and ammonia - BAAQMD ST-1B. EPA approved alternative tes methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4702]

22. Compliance demonstration (source testing) shall be District witnessed, or authorized and samples shall be collected b a California Air Resources Board certified testing laboratory. Source testing shall be conducted using the methods an procedures approved by the District. Source testing may occur more frequently than once every 12 months at the discretion of the equipment owner or operator, if such frequency is necessary to schedule source testing during norma operating periods. Any source testing conducted more frequently than required, shall reset the 12 month testing clock. [District Rule 1081]

23. Source testing shall be conducted using the methods and proeedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]

24. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

25. Testing to demonstrate compliance with the fuel H2S content limit of this permit shall be conducted monthly and shall be scheduled for days in which NOx emissions are being measured or monitored. After six (6) consecutive monthly tests show compliance, the fuel H2S content testing frequency may be reduced to once every calendar quarter. If a quarterly test shows a violation of the H2S content limit of this permit, then monthly testing shall resume and continue until six consecutive tests show compliance. Once compliance is shown on six consecutive monthly tests, then testing may return to quarterly. Additionally, during the initial 24-month NOx emission limit evaluation period, testing of the H2S content of the fuel gas shall also be conducted on days when NOx emissions are found to exceed 0.15 g/bhp-hr and the H2S fuel content has not been measured within the last 24 hours. Records of the results of H2S testing shall b maintained. [District Rule 2201]

26. H2S content of the fuel shall be measured using EPA Method 15, ASTM Method D1072, D3246, D4084, D5504, with the use of the Testo 350 XL portable analyzer, or an alternative method approved by the District.. [District Rule 2201]

27. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent wit EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

28. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the engine is not in operation, i.e. the engine need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the engine unless monitoring has been performed within the last month. Records must be maintained of the dates of non-operation to validate extended monitoring frequencies. [District Rules 2201 and 4702]

29. Within 90 days of implementation of this ATC, the permittee shall monitor and record the stack concentration of NH3 at least once every calendar quarter in which a source test is not performed. NH3 monitoring shall be conducted utilizing District approved gas-detection tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within five days of restarting the unit unless monitoring has been performed within the last quarter. [District Rules 2201 and 4102]

CONDITIONS CONTINUE ON NEXT PAGE

30. If the NOx or CO concentrations corrected to 15% O2, as measured by the portable analyzer, or the NH3 concentrations corrected to 15% O2, as measured by District approved gas-detection tubes, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, bu no longer than 8 hours of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 8 hours of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. During the initial 24-month NOx limit evaluation period, NOx emissions not exceeding 0.60 g-NOx/bhp-hr (= 44 ppmvd NOx @ 15% O2) are not subject to the requirements contained in this condition to source test or stipulate that an emissions violation has occurred. [District Rules 2201 and 4702]

31. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the permit-to-operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4702]

32. The permittee shall maintain records of: (1) the date and time of NOx, CO, O2 and NH3 measurements, (2) the O2 concentration in percent and the measured NOx, CO, and NH3 concentrations corrected to 15% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, (5) the method of determining the NH3 emission concentration, and (6) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 2201 and 4702]

33. The permittee shall maintain an engine operating log for this engine. The log shall include, on a monthly basis, the total hours of operation, type and quantity of fuel used, maintenance and modifications performed, monitoring data, compliance source test results, and any other information necessary to demonstrate compliance with District Rule 4702. Quantity of fuel used shall be recorded in standard cubic feet and calculated as follows: Specific engine fuel use in standard cubic feet per month = Total facility fuel use in standard cubic feet per month x (Specific engine gross kW hours per month) ÷ (Total facility gross kW-hours per month). [District Rule 4702]

34. Records of biogas analyzer installed to monitor methane, carbon dioxide, and hydrogen sulfide shall be maintained an shall be made available for District inspection upon request. [District Rule 2201]

35. All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 2201 and 4702]

36. This engine shall be operated and maintained in proper operating condition per the manufacturer's requirements as specified on the Inspection and Monitoring (I&M) plan submitted to the District. [District Rule 4702]

37. This engine shall be operated within the ranges that the source testing has shown result in pollution concentrations within the emissions limits as specified on this permit. [District Rule 4702]

38. The permittee shall update the I&M plan for this engine prior to any planned change in operation. The permittee must notify the District no later than seven days after changing the I&M plan and must submit an updated I&M plan to the APCO for approval no later than 14 days after the change. The date and time of the change to the I&M plan shall be recorded in the engine's operating log. For modifications, the revised I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit to Operate. The permittee may request a change to the I&M plan at any time. [District Rule 4702]

39. The permittee shall obtain written District approval for the use of any equivalent control equipment not specifically approved by this Authority to Construct. Approval of the equivalent control equipment shall be made only after the District's determination that the submitted design and performance of the proposed alternate control equipment is equivalent to the specifically authorized equipment. [District Rule 2010]

CONDITIONS CONTINUE ON NEXT PAGE

40. The permittee's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2010]

41. Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

42. No emission factor and no emission shall be greater for the alternate equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

MAY 2 8 2008

Marlin Statema
AgPower Partners #3, LLC
6920 Salashian Parkway, A-102
Ferndale, WA 93277

Re: Notice of Incomplete Application
Project Number: S-1080811

Dear Mr. Statema:

The District has reviewed the information received regarding your Authority to Construct application for construction of a plug flow anaerobic digester system, including a biogas-fired flare, and installation of two fulltime biogas-fired IC engines at Moonlight Dairy located at 5061 Avenue 280 in Visalia, CA. Based on our preliminary review, the application remains incomplete. The following information is required prior to further processing:

1. The new biogas gas-fired IC engines will be subject to the Best Available Control Technology (BACT) requirements of District Rule 2201. District Rule defines BACT as "the most stringent emission limitation or control technique" that is: 1) Achieved in practice for such category and class of source; 2) Contained in any State Implementation Plan approved by the EPA for such category and class of source; 3) Contained in an applicable federal New Source Performance Standard; or 4) Any other emission limitation or control technique, including process and equipment changes of basic or control equipment, found by the District to be cost effective and technologically feasible for such class or category of sources or for a specific source. Because of the requirement that BACT be the most stringent emission control, BACT requirements are periodically updated to reflect the reclassification of technologies that were formerly considered "technologically feasible" as "achieved in practice" and to reflect other advances in emission control technology.

   As you are aware, the District is currently updating the BACT determination for digester gas-fired engines. Based on the District's review of the technology available to reduce NO_X emissions from biogas-fired equipment, it has been determined that it is technologically feasible for biogas-fired engines and microturbines to meet an emission limit of 9 ppmv NO_X @ 15% O_2. The District is aware of other digester gas-fired IC engines and turbines at wastewater treatment facilities that are currently using SCR to lower emissions. The District believes that with proper gas conditioning this

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061
www.valleyair.org

Southern Region
2700 M Street, Suite 275
Bakersfield, CA 93301-2373
Tel: (661) 326-6900 FAX: (661) 326-6985

technology can also be used to reduce emissions from equipment fired on dairy digester gas. Based on the current cost-effective thresholds, the District expects these reductions to be cost-effective. The District is also aware of digester gas-fired microturbines that are expected to meet very low emission limits; therefore this is also an alternate option. The District has an obligation to minimize emissions to the maximum extent feasible; therefore, the project will remain incomplete until the BACT requirements are satisfied. As stated above, Installing a catalyst (SCR) on the proposed engines or utilizing microturbines or biogas-powered fuel cells rather than reciprocating IC engines are possible ways to meet the required NO_X emissions limit. If you have not yet done so, please provide the complete cost associated with installing a catalyst on the engine or installing a microturbine or fuel cell rather than a reciprocating engine.

2. Your concerns regarding the additional cost of another scrubber system have been noted. However, as stated previously, a biogas H_2S content of 50 ppmv or less may be required to ensure that the chosen NO_X emissions technology functions properly. The cost of the additional scrubber will be factored into the BACT cost analysis for the system in order to ensure the reductions in NO_X and SO_X emissions are cost-effective for the proposed system.

In response, please refer to the above project number, and send to the attention of Mr. Ramon Norman.

Please submit the requested information within 30 days. The District will not be able to process your application until this information is received.

Thank you for your cooperation in this matter. If you have any questions, please contact Mr. Ramon Norman at (559) 230-5909.

Sincerely,

David Warner
Director of Permit Services

Mark Keast for

Jim Swaney, P.E.
Permit Services Manager
DW:rn

cc: John Moons, Moonlight Dairy, 5061 Ave 280, Visalia, CA 93277

Dave Mitchell, Michael Brandman Associates, 2444 Main Street, Suite 115, Fresno, CA 93721